

[DESCRIPTION]

[TITLE OF INVENTION]

DRIVING BEHAVIOR SCORING METHOD, DEVICE AND COMPUTER READABLE STORAGE MEDIUM

[TECHNICAL FIELD]

The present disclosure relates to the technical field of vehicle driving behavior analysis, and in particular, to a driving behavior scoring method, device, and a computer-readable storage medium.

[BACKGROUND]

In recent years, the number of motor vehicles is increasing, and meanwhile, as the internet of vehicles is rapidly developed, the number of vehicle insurance products which are priced based on the driving behavior of the driver and combined with the internet of vehicles technology is increasing.

UBI (Usage Based Insurance) car insurance refers to car insurance priced based on driving behavior and car usage data, which is a new type of car insurance appearing in the context of free rates of car insurance. The insurance company evaluates the driving behavior risk grade of the driver through collecting driving behavior data and vehicle running data and analyzing and processing the data. For car owners with good driving behaviors, the insurance company may give more preferential benefits, and for car owners with poor driving behaviors, the insurance company may correspondingly increase insurance fees. Therefore, it is helpful for the vehicle owner to cultivate good driving behaviors, reduce accidents, and reduce accident reports and claims, thereby improving traffic conditions and reducing social costs.

Therefore, for an insurance company, before pricing a car insurance product, an assessment of driving behavior risk needs to be made first based on driving data of the driver, and currently, a method of supervised learning in machine learning is generally adopted to obtain a relationship between driving behavior and driving risk, and training samples need to contain driving behavior and vehicle usage data as well as accident settlement data at the same time. Driving behavior and vehicle usage data are collected, and generally, vehicle travelling data is obtained by a sensor in a device such as a vehicle-mounted OBD (On-Board Diagnostic) device or a smart phone, and

if the device is provided with a camera, a driving video can be obtained through the camera so as to obtain further data reflecting driving habits. In an accurate measurement of the degree of risk, it is necessary to know whether the observed driver has a traffic accident in a period within which the driving behavior is observed, and claims to the insurance company, and the driving risk is represented by the accident rate or the claim rate. After both of the above are obtained, the driving data is used as the features in the supervised algorithm, the accident rate or the claim rate is used as the supervisory signal in the supervised algorithm, and the supervised algorithm obtains the relation between the features and the supervisory signal based on the training data, namely, the relation between the driving data and the accident rate or the claim rate. For a target sample whose driving behavior risk needs to be determined, namely, a driver with driving data alone, his driving behavior risk is obtained through an inferred relationship resulting from the supervised algorithm.

[SUMMARY OF THE INVENTION]

The following presents a simplified summary of the disclosure, in order to provide basic understandings on some aspects of the disclosure. However, it should be understood that this summary is not an exhaustive overview of the disclosure. It is not intended to identify key or critical parts of the disclosure, nor is it intended to limit the scope of the disclosure. Its sole purpose is to present some concepts related to the disclosure in a simplified form as a prelude to the more detailed description that is presented later.

An object of the embodiments of the disclosure is to provide a driving behavior scoring method, a device, and a computer-readable storage medium for accurately performing driving behavior scoring prediction for a target driver by using different driving scoring methods in different stages of data accumulation. The specific technical schemes of the embodiments of the disclosure are as follows:

In a first aspect, the embodiment of the present disclosure provides a driving behavior scoring method, the method comprising:

accumulating sample data including sample driving data and sample insurance policy data of sample drivers;

determining a current accumulation stage of the sample data according to an accumulation amount of the sample driving data and the sample insurance policy data;
and

scoring a driving behavior of a current driver by the accumulated sample data using a driving scoring method corresponding to the current accumulation stage.

In some embodiments, when the accumulation amount of the sample insurance policy data is less than a first threshold, the current accumulation stage of the sample data is determined as a first stage, and

the driving behavior of the current driver is scored by the sample driving data in the accumulated sample data using a driving scoring method corresponding to the first stage.

In some embodiments, when the accumulation amount of the sample insurance policy data is above a first threshold, the current accumulation stage of the sample data is determined as a second stage, and

the driving behavior of the current driver is scored by the sample driving data and the sample insurance policy data in the accumulated sample data using a driving scoring method corresponding to the second stage.

In some embodiments, the first stage includes a third stage in which the accumulated amount of the sample insurance policy data is less than the first threshold and the accumulated amount of the sample driving data is less than a second threshold,

when the current accumulation stage is the third stage, the scoring the driving behavior of the current driver includes:

acquiring driving data of the current driver, and extracting driving characteristics of the current driver; and

obtaining the score of the driving characteristics of the current driver according to a preset scoring standard, to serve as the score of the driving behavior of the current driver.

In some embodiments, the first stage includes a fourth stage in which the accumulated amount of the sample insurance policy data is less than the first threshold and the accumulated amount of the sample driving data is above a second threshold,

when the current accumulation stage is the fourth stage, the scoring the driving behavior of the current driver includes:

extracting sample driving characteristics of the sample drivers from the sample driving data of the sample drivers;

calculating distribution parameters of the sample driving characteristics according

to the sample driving characteristics of the sample drivers;

acquiring driving data of the current driver, and extracting driving characteristics of the current driver; and

calculating a cumulative distribution function of the driving characteristics of the current driver according to the distribution parameters of the sample driving characteristics, to serve as the driving behavior score of the current driver.

In some embodiments, the second stage includes a fifth stage in which the accumulation amount of the sample insurance policy data is above the first threshold and the accumulation amount of the sample insurance policy data is less than the accumulation amount of the sample driving data,

when the current accumulation stage is the fifth stage, the scoring the driving behavior of the current driver includes:

acquiring driving scores of a plurality of sample drivers corresponding to the sample insurance policy data according to the sample insurance policy data;

performing cluster analysis on the driving data of the plurality of sample drivers to obtain a plurality of cluster centers, wherein each cluster serves as a risk grade cluster, and calculating the driving score of each risk grade cluster according to the driving scores of the plurality of sample drivers;

acquiring the driving data of the current driver, and calculating a similarity distance between the driving data of the current driver and the plurality of cluster centers; and

determining a risk grade cluster corresponding to the current driver according to the calculation result of the similarity distance, and taking the driving score of the determined risk grade cluster as the driving score of the current driver.

In some embodiments, the second stage includes a sixth stage in which the accumulation amount of the sample insurance policy data is above the first threshold and the accumulation amount of the sample insurance policy data is equal to the accumulation amount of the sample driving data,

when the current accumulation stage is the sixth stage, the scoring the driving behavior of the current driver includes:

acquiring driving scores of a plurality of sample drivers corresponding to the sample insurance policy data according to the sample insurance policy data;

extracting sample driving characteristics of the plurality of sample drivers from the sample driving data;

establishing a driving behavior scoring model according to the sample driving characteristics and the corresponding driving scores of the plurality of sample drivers; and

scoring the driving behavior of the current driver by using the driving behavior scoring model.

In some embodiments, the obtaining the driving scores of a plurality of sample drivers corresponding to the policy data according to the sample insurance policy data includes:

for the sample insurance policy data of each of the plurality of sample drivers, performing the steps of:

acquiring an insurance claim value from the sample insurance policy data; and

determining the driving score which has a mapping relation with the insurance claim value according to a preset mapping relation table, to serve as the driving score of the sample driver.

In a second aspect, the embodiment of the present disclosure provides a driving behavior scoring device, including:

an accumulation module configured to accumulate sample data including sample driving data and sample insurance policy data of sample drivers;

a determining module configured to determine a current accumulation stage of the sample data according to an accumulation amount of the sample driving data and the sample insurance policy data; and

a scoring module configured to score a driving behavior of a current driver by the accumulated sample data using a driving scoring method corresponding to the current accumulation stage.

In some embodiments, when the accumulation amount of the sample insurance policy data is less than a first threshold, the current accumulation stage of the sample data is determined as a first stage, and

the driving behavior of the current driver is scored by the sample driving data in the accumulated sample data using a driving scoring method corresponding to the first stage.

In some embodiments, when the accumulation amount of the sample insurance policy data is above a first threshold, the current accumulation stage of the sample data is determined as a second stage, and

the driving behavior of the current driver is scored by the sample driving data and

the sample insurance policy data in the accumulated sample data using a driving scoring method corresponding to the second stage.

In some embodiments, the first stage includes a third stage in which the accumulated amount of the sample insurance policy data is less than the first threshold and the accumulated amount of the sample driving data is less than a second threshold,

when the current accumulation stage is the third stage, the scoring module is configured to:

acquire driving data of the current driver, and extract driving characteristics of the current driver; and

obtain a score of the driving characteristics of the current driver according to a preset scoring standard, to serve as the score of the driving behavior of the current driver.

In some embodiments, the first stage includes a fourth stage in which the accumulated amount of the sample insurance policy data is less than the first threshold and the accumulated amount of the sample driving data is above a second threshold,

when the current accumulation stage is the fourth stage, the scoring module is configured to:

extract sample driving characteristics of the sample drivers from the sample driving data of the sample drivers;

calculate distribution parameters of the sample driving characteristics according to the sample driving characteristics of the sample drivers;

acquire driving data of the current driver, and extract driving characteristics of the current driver; and

calculate a cumulative distribution function of the driving characteristics of the current driver according to the distribution parameters of the sample driving characteristics, to serve as the driving behavior score of the current driver.

In some embodiments, the second stage includes a fifth stage in which the accumulation amount of the sample insurance policy data is above the first threshold and the accumulation amount of the sample insurance policy data is less than the accumulation amount of the sample driving data,

when the current accumulation stage is the fifth stage, the scoring module is configured to:

acquire driving scores of a plurality of sample drivers corresponding to the sample insurance policy data according to the sample insurance policy data;

perform cluster analysis on the driving data of the plurality of sample drivers to obtain a plurality of cluster centers, wherein each cluster serves as a risk grade cluster, and calculate the driving score of each risk grade cluster according to the driving scores of the plurality of sample drivers;

acquire driving data of the current driver, and calculate a similarity distance between the driving data of the current driver and the plurality of cluster centers; and

determine a risk grade cluster corresponding to the current driver according to the calculation result of the similarity distance, and take the driving score of the determined risk grade cluster as the driving score of the current driver.

In some embodiments, the second stage includes a sixth stage in which the accumulation amount of the sample insurance policy data is above the first threshold and the accumulation amount of the sample insurance policy data is equal to the accumulation amount of the sample driving data,

when the current accumulation stage is the sixth stage, the scoring module is configured to:

acquire driving scores of a plurality of sample drivers corresponding to the sample insurance policy data according to the sample insurance policy data;

extract sample driving characteristics of the plurality of sample drivers from the sample driving data;

establish a driving behavior scoring model according to the sample driving characteristics and the corresponding driving scores of the plurality of sample drivers; and

score the driving behavior of the current driver by using the driving behavior scoring model.

In some embodiments, the obtaining the driving scores of a plurality of sample drivers corresponding to the policy data according to the sample insurance policy data includes:

for the sample insurance policy data of each of the plurality of sample drivers, performing the following operations:

acquiring an insurance claim value from the sample insurance policy data; and

determining the driving score which has a mapping relation with the insurance claim value according to a preset mapping relation table, to serve as the driving score

of the sample driver.

In a third aspect, the embodiment of the present disclosure provides a driving behavior scoring device, including:

one or more processors;

storage means for storing one or more programs;

when the one or more programs are executed by the one or more processors, the one or more processors are caused to implement the driving behavior scoring method as set forth in the first aspect.

In a fourth aspect, the embodiment of the present disclosure provides a computer-readable storage medium on which a computer program is stored, wherein when the program is executed by a processor, implements the driving behavior scoring method as set forth in the first aspect.

According to the driving behavior scoring method, the driving behavior scoring device and the computer-readable storage medium provided in the embodiment of the present disclosure, the sample data are accumulated, the current accumulation stage of the sample data is determined according to the accumulation amount of the sample, and the driving behavior of the current driver is scored using the driving scoring method corresponding to the current accumulation stage. Thus, the risk of driving behavior can be assessed at different stages of data accumulation.

[BRIEF DESCRIPTION OF THE DRAWINGS]

In order to more clearly explain the technical solution in the embodiment of the disclosure, the drawings which are needed in the embodiment description are simply introduced below, and obviously, the drawings in the following description are only some embodiments of the disclosure, and other drawings can be obtained by a person with ordinary skill in the art without creative efforts.

FIG. 1 illustrates an exemplary flow chart of a driving behavior scoring method according to one embodiment of the present disclosure;

FIG. 2 illustrates an exemplary flow chart of a driving behavior scoring method according to another embodiment of the present disclosure;

FIG. 3 illustrates an exemplary flow chart of a driving behavior scoring method according to another embodiment of the disclosure;

FIG. 4 illustrates an exemplary flow chart of a driving behavior scoring method according to another embodiment of the disclosure;

FIG. 5 illustrates an exemplary flow chart of a driving behavior scoring method according to another embodiment of the disclosure;

FIG. 6 illustrates an exemplary configuration block diagram of a driving behavior scoring device according to another embodiment of the present disclosure;

FIG. 7 illustrates an exemplary configuration of a computing device in which embodiments according to the present disclosure may be implemented.

[DETAILED DESCRIPTION]

In order to make the objects, technical solutions and advantages of the present disclosure more apparent, technical solutions in embodiments of the present disclosure will be described clearly and completely below with reference to the drawings in the embodiments of the present disclosure, and it is apparent that the described embodiments are only some instead of all embodiments of the present disclosure. All other embodiments, which can be derived by a person of ordinary skill in the art based on the embodiments in the present disclosure without creative efforts, are within the scope of the present disclosure.

In making an evaluation of the driving behavior risk based on the driving data of the driver, one way the inventors of the present disclosure know is to use a method of supervised learning in machine learning to obtain the relationship between the driving behavior and the driving risk. However, this type of supervised learning method requires accumulation of a large amount of driving data and claim settlement data, and the claim settlement period needs to be in agreement with the driving data collection period. If there is no accident claim data, or the data does not reach a certain amount, the algorithm is difficult to start. However, in actual operation, it is often convenient to collect driving data at the beginning of system operation, but accidents and claims would not occur immediately, so that accident and claim data cannot be obtained while driving data are collected. Meanwhile, with the accumulation of driving travel and data, even if an accident occurs, because the claim settlement process comprises a plurality of steps of investigation, including loss assessment, maintenance, claim settlement and the like, a certain time is needed, and acquisition of the insurance and claim settlement data may still have a delay for a period of time, so that the supervised algorithm is difficult to start.

The embodiment of the present disclosure provides a driving behavior scoring method that can accurately predict a target driver's driving behavior score using

different driving behavior scoring methods at different stages of data accumulation.

The execution subject of the driving behavior scoring method may be a server. The server can be communicatively connected to a mobile terminal equipped with a mobile SDK (Software Development Kit) module and a vehicle-mounted depth camera module through a network. The mobile SDK module may be, for example, a software development kit provided by the mobile terminal, and the disclosure does not limit this.

The server can also be in butt joint with the insurance policy system through a preset interface to obtain the insurance policy data of the driver. The preset interface involved in the present disclosure refers to some predefined functions in the software system, which are used for interacting with and transmitting data to other systems, and the present disclosure does not limit the preset interface.

The server may be a single server or a server group composed of a plurality of servers, and in the server group, the plurality of servers may be communicatively connected to each other. The mobile terminal equipped with the mobile SDK module can be a mobile terminal of the driver, which may collect the driving behavior data of the driver by the mobile SDK module and upload it to the server. The vehicle-mounted depth camera module can be mounted on the vehicle of the driver and can upload the collected driving video data to the server.

FIG. 1 illustrates an exemplary flow chart of a driving behavior scoring method according to one embodiment of the present disclosure.

As shown in fig. 1, in step S1, sample data including sample driving data and sample insurance policy data of sample drivers is accumulated.

In some embodiments, the sample driving data of a sample driver may include at least one of driving behavior data, driving environment data, and driving video data.

In some embodiments, the driving behavior data of the sample driver may be obtained by the mobile SDK module. The driving behavior data may be various basic information of the vehicle during driving, which may include driving time information, mileage information, speed information, steering information, latitude and longitude information, altitude information, mobile phone call state information, rapid acceleration information, rapid deceleration information, and rapid turning information.

In the specific implementation process, the data of a GPS, an accelerometer and a gyroscope sensor can be acquired through the mobile SDK module in the mobile terminal of the sample driver during the driving process of the sample driver so as to acquire the driving behavior data of the sample driver, and upload the driving behavior data of the sample driver to a server, the server binds and stores the driving behavior data of the sample driver and the identity of the sample driver.

In some embodiments, the driving environment data of the sample driver may be obtained through a preset interface. The driving environment data may be various kinds of environment information related to driving behavior in the environment where the driving is occurred, and may include a road section speed limit, a driving area, a road type, a terrain condition, a current weather condition during driving, and the like. After the driving environment data of the sample driver is acquired through the preset interface, the driving environment data is uploaded to the server, and the server binds and stores the driving environment data of the sample driver and the identity of the sample driver.

In some embodiments, the driving video data may be acquired by a vehicle-mounted camera. The driving video data is a video during driving that is acquired by the camera, and may include distance measurement information, lane information, road condition information, driving events, and the like. After the vehicle-mounted camera acquires the driving video data, the driving video data is uploaded to the server, and the server binds and stores the driving video data of the sample driver and the identity of the sample driver.

In some embodiments, sample insurance policy data for a sample driver may be obtained through a preset interface. The insurance policy data may be various information related to the insurance policy of the driver, and may include basic information of the driver, purchase information of the insurance policy, a policy claim amount, an insurance claim amount, and the like, wherein the purchase information of the insurance policy includes information of insurance type, insurance amount, and the like.

In the specific implementation process, the server can be in butt joint with the insurance policy system through the preset interface, and the insurance policy data corresponding to the identity of the sample driver is acquired from the service policy system according to the identity of the sample driver.

It should be noted that identity of the driver may be a mobile phone number, a

user name, an identification card of the driver, or other information capable of uniquely identifying the driver.

In step S2, the current accumulation stage of the sample data is determined according to the accumulation amount of the sample driving data and the sample insurance policy data.

In some embodiments, when the accumulation amount of sample insurance policy data is less than a first threshold, the current accumulation stage of sample data is determined to be a first stage. Further, when the accumulation amount of the sample insurance policy data is above the first threshold, the current accumulation stage of the sample data is determined as a second stage.

When the current accumulation stage of the sample data is the first stage, the accumulation amount of the sample insurance policy data is low and insufficient for scoring the driving behavior. Therefore, the driving behavior of the current driver can be scored using only the sample driving data. In this way, the driving behavior of the driver can be scored even if there is not enough insurance policy data at the beginning of the sample data acquisition.

When the current accumulation stage of the sample data is the second stage, the accumulation amount of the sample insurance policy data is sufficient and can be used for scoring the driving behavior. Therefore, the driving behavior of the current driver can be scored by using the sample driving data and the sample insurance policy data at the same time. In this way, the driving behavior of the driver can be scored using a more optimal driving scoring method.

In some embodiments, the first stage may include a third stage in which the accumulation amount of the sample insurance policy data is less than a first threshold and the accumulation amount of the sample driving data is less than a second threshold. For example, the third stage may be a cold start stage where the sample data includes only a small amount of sample driving data and does not include sample insurance policy data. The so-called cold start stage is a stage at which the system operation is still started in the case where specific data is not obtained at the initial stage of the system operation. In the present disclosure, the cold start stage refers to a stage of scoring the driving behavior of the driver based on only the sample driving data without any sample insurance policy data.

In some embodiments, the first stage may include a fourth stage in which the accumulation amount of the sample insurance policy data is less than a first threshold

and the accumulation amount of the sample driving data is above a second threshold. For example, the fourth stage may be an early stage in which the sample data includes sample driving data of a plurality of sample drivers and a minute amount of sample insurance policy data.

In some embodiments, the second stage may include a fifth stage in which the accumulation amount of the sample insurance policy data is above the first threshold and the accumulation amount of the sample insurance policy data is less than the accumulation amount of the sample driving data. For example, the fifth stage may be a middle stage where the sample data includes sample driving data for a plurality of sample drivers and sample insurance policy data for a part of the sample drivers.

In some embodiments, the second stage may include a sixth stage in which the accumulation amount of the sample insurance policy data is above the first threshold and the accumulation amount of the sample insurance policy data is equal to the accumulation amount of the sample driving data. For example, the sixth stage may be a late stage where the sample data includes sample driving data and corresponding sample insurance policy data for a plurality of sample drivers.

It should be understood that the above mentioned first threshold and the second threshold are values predetermined according to actual conditions, and the present disclosure does not limit the selection of the thresholds.

Further, in the present disclosure, the accumulation amount of the sample insurance policy data is smaller than the accumulation amount of the sample driving data means that the sample data includes the sample driving data of a plurality of sample drivers and includes only the sample insurance policy data of a part of the plurality of sample drivers. In addition, the accumulation amount of the sample insurance policy data is equal to the accumulation amount of the sample driving data means that the sample data includes sample driving data of a plurality of sample drivers and includes sample insurance policy data of the plurality of sample drivers.

In the following description, the cold start stage, the early stage, the middle stage, and the late stage are used to represent the third stage, the fourth stage, the fifth stage, and the sixth stage, respectively.

In step S3, the driving behavior of the current driver is scored by the accumulated sample data using a driving scoring method corresponding to the current accumulation stage. The driving behaviors at different stages are scored by different

driving scoring methods.

According to the driving behavior scoring method provided by the embodiment of the disclosure, the sample data is accumulated, the current accumulation stage of the sample data is determined, and the driving behavior of the current driver is scored by using the driving scoring method corresponding to the current accumulation stage. Therefore, the driving behavior score can be provided at the beginning of driving data acquisition, and parameters and models are gradually optimized along with the accumulation of driving data and the addition of claim settlement data, so that the driving behavior risk can be evaluated at different stages of data accumulation.

In one embodiment of the present disclosure, when the current stage is the cold start stage, the accumulation of the driving data of the sample drivers just begins, and there is no insurance policy data of the sample drivers, thus the driving behavior of the current driver can be scored by using a driving scoring method based on rules and preset weights. Specifically, as shown in Fig. 2, the scoring the driving behavior of the current driver by using the driving scoring method corresponding to the current accumulation stage at the step S3 may include the following steps:

S311, acquiring driving data of the current driver, and extracting one or more driving characteristics of the current driver.

Wherein the driving data of the current driver may include at least one of driving behavior data, driving environment data, and driving video data.

Specifically, the driving behavior data may be acquired by the mobile SDK module, and at least one driving behavior characteristic, including driving mileage per trip or unit time period, driving duration, maximum driving speed, the number of rapid accelerations, the number of rapid decelerations, the number of rapid turnings, the number of rapid lane changes, whether fatigue driving, whether driving in a dangerous time period, is extracted from the driving behavior data.

The driving environment data can be obtained through a preset interface, and at least one driving environment characteristic, including overspeed times and duration per trip or unit time period, whether in a dangerous environment, whether in a familiar road section and whether in severe weather, is extracted from the driving environment data.

The driving video data can be acquired through the vehicle-mounted camera, and at least one driving video characteristic, including a distance-vehicle speed ratio, whether to follow a lane and whether to decelerate when an event occurs in front, is

extracted from the driving video data.

S312, dividing the driving characteristics into a plurality of dimensions, wherein each dimension comprises several types of driving characteristics.

Specifically, the extracted plurality types of driving characteristics may be divided into several dimensions, such as speed, mileage, time, environment, driving behavior, and the like, where each dimension includes several characteristics. For example, the dimension “velocity” may include several characteristics related to velocity, such as overspeed times, overspeed duration, and highest driving speed; the dimension “driving behavior” may include several characteristics related to driving operation, such as the number of rapid acceleration, the number of rapid decelerations, the number of rapid turnings, the number of rapid lane changes, the distance-vehicle speed ratio, whether to follow the lane, and whether to decelerate when an event occurs in front.

S313, obtaining scores of respective types of driving characteristics according to a preset scoring standard.

Specifically, scoring standards may be set respectively for the driving characteristics, and the scoring standards corresponding to the respective driving characteristics may be set differently according to specific situations.

Illustratively, the scoring standard for the driving characteristic of overspeed times may be:

score of overspeed times = $100 - \text{overspeed times} \times 10 / \text{driving mileage}$, where the lower bound is 0, which means if averagely, overspeed occurs once per kilometer, 10 scores are subtracted, and if averagely, overspeed times per kilometer is ≥ 10 , the driving characteristic is scored 0.

S314, performing weighting calculation on the scores of respective types of driving characteristics in each dimension to obtain the score of each dimension.

Specifically, the score of each dimension may be obtained by weighting and summing the scores of the respective characteristics in each dimension according to the characteristic weights set for respective types of driving characteristics, where the sum of the characteristic weights in each dimension is 1.

The dimension score calculation formula is: dimension score = $\sum \text{characteristic score} \times \text{characteristic weight}$.

S315, performing weighting calculation on the scores of all dimensions to obtain the driving behavior score of the current driver.

Specifically, the driving behavior scores of the drivers may be obtained by performing weighting and summing the respective dimension scores according to the dimension weights set for the respective dimensions, where a sum of the respective dimension weights is 1.

The driving behavior score calculation formula is: driving behavior score = $\sum$ dimension score * dimension weight.

In some embodiments, in steps S311 to S315 described above with reference to Fig. 2, the driving characteristics of the current driver may not be dimensionally divided, and the score of the driving characteristics may be obtained and then directly used as the driving behavior score of the current driver.

According to the embodiment of the invention, when the current stage is the cold start stage, the accumulation of the driving data of the sample drivers just begins, and the insurance policy data of the sample drivers does not exist, the use of a driving scoring method corresponding to the cold stage to score the driving behavior of the current drive solves the problem existing in the prior art that the driving behavior scoring cannot be carried out due to the difficulty in starting the supervised algorithm due to insufficient sample data accumulation at the initial stage of system operation.

In one embodiment of the present disclosure, when the current stage is the initial stage in the accumulation process of the sample data, a certain amount of driving data of the sample drivers is accumulated, the insurance policy data of the sample drivers is still little or almost none, and the degree of association with the driving data of the drivers is integrally low, thus the driving behavior scoring of the current driver can be performed by using a driving scoring method based on a characteristic distribution function. Specifically, as shown in Fig. 3, scoring the driving behavior of the current driver by using the driving scoring method corresponding to the current accumulation stage in step S3 may include the following steps:

S321, respectively extracting a plurality types of sample driving characteristics of each sample driver from the sample driving data of the respective sample driver.

Specifically, the process may refer to step S311, which is not described in detail herein.

S322, calculating distribution parameters of respective types of sample driving characteristics according to one or more sample driving characteristics of each sample driver.

Specifically, assuming that a sample driving characteristic follows a certain distribution, the sample driving characteristic of all sample drivers can be summarized, and the summarized data is cleaned, including necessary abnormal value detection and data normalization, and a parameter of a distribution function followed by the sample driving characteristic is obtained based on data fitting after cleaning, and by analogy, distribution parameters of other sample driving characteristics are obtained.

Illustratively, assuming a certain sample driving characteristic, such as an average number x of rapid accelerations per kilometer follows exponential distribution, the cumulative distribution function being as follows:

$$F(x) = \begin{cases} 0, & x \leq 0 \\ 1 - e^{-\lambda_{acc}x}, & x > 0 \end{cases}$$

where $\lambda_{acc} > 0$.

The driving characteristic of all sample drivers is summarized, necessary abnormal value detection and data normalization are performed, and data fitting is performed based on the cleaned data to obtain the parameter λ_{acc} of a distribution function followed by the characteristic, namely, the average number of rapid accelerations per kilometer.

S323, acquiring driving data of the current driver, and extracting one or more types of driving characteristics of the current driver.

Specifically, the process may refer to step S311, which is not described in detail herein.

S324, respectively calculating the cumulative distribution functions of the respective types of driving characteristics of the current driver according to the distribution parameters of the respective types of sample driving characteristics, to serve as scores corresponding to the respective types of driving characteristics.

Illustratively, for a certain driving characteristic of the current driver, for example, an average number x_{obj} of rapid accelerations per kilometer, a cumulative distribution function value $1 - e^{-\lambda_{acc}x_{obj}}$ is obtained based on the parameter λ_{acc} of exponential distribution followed by the driving characteristic, which is used as the score corresponding to the driving characteristic.

S325, performing weighted calculation on the scores of the respective types of driving characteristics to obtain the driving behavior score of the current driver.

According to the embodiment of the present disclosure, when the current stage is the initial stage, a certain amount of driving data of the sample drivers is accumulated, the insurance policy data of the sample drivers is still little or almost none, the degree of association with the driving data of the drivers is integrally low, thus the driving behavior of the current driver can be scored by using the driving scoring method corresponding to the initial stage, such that the problem existing in the prior art that the driving behavior scoring cannot be performed due to the fact that the supervised algorithm is difficult to start due to insufficient accumulation of sample data at the initial stage of system operation can be solved.

In one embodiment of the present disclosure, when the current stage is the middle stage in the accumulation process of the sample data, a certain amount of driving data of the sample drivers and insurance policy data of a part of the sample drivers are accumulated, and the driving behavior of the current driver can be scored by using a driving scoring method based on cluster analysis. Specifically, as shown in Fig. 4, scoring the driving behavior of the current driver by using the driving scoring method corresponding to the current accumulation stage in step S3 may specifically include the following steps:

S331, acquiring driving scores of a plurality of sample drivers corresponding to the sample insurance policy data according to the sample insurance policy data.

Specifically, the following operations may be performed for the insurance policy data of each sample driver:

acquiring an accident claim value from the insurance policy data, and determining a driving score which has a mapping relation with the accident claim value according to a preset mapping relation table, to serve as the driving score of the sample driver; wherein, in the preset mapping relation table, the higher the claim settlement rate, the lower the corresponding driving behavior score.

The accident settlement numerical value can be obtained by extracting the accident rate or the claim rate of the sample driver from insurance policy data of the sample driver, and obtaining the driving behavior score of the sample driver from a preset mapping relation table according to the accident rate or the claim rate, to serve as a score label of the sample driver. In the mapping relation table, the higher the claim settlement rate, the lower the corresponding driving behavior score, and the score may range from 0 to 100, for example.

S332, performing cluster analysis on the driving data of the plurality of sample

drivers to obtain a plurality of cluster centers, wherein each cluster serves as a risk grade cluster, and calculating the driving score of each risk grade cluster according to the driving scores of the plurality of sample drivers.

Cluster analysis on driving data of a part of the sample drivers may be performed by using a K-means algorithm, wherein each cluster serves as a risk grade cluster to obtain a cluster center, and it is considered that the drivers in the same cluster have the same or similar risk grade, and an average value of the driving scores of the sample drivers in the same cluster is used as the driving score of the cluster (i.e., the risk grade cluster).

S333, acquiring the driving data of the current driver, and calculating a similarity distance between the driving data of the current driver and the plurality of cluster centers.

Specifically, the embodiment of the present disclosure does not limit the specific calculation process.

S334, determining a risk grade cluster corresponding to the current driver according to the calculation result of the similarity distance, and taking the driving score of the determined risk grade cluster as the driving score of the current driver.

Specifically, the risk grade cluster corresponding to the minimum value in the calculation result of the similarity distance is used as the risk grade cluster corresponding to the current driver.

According to the embodiment of the present disclosure, when the current stage is the middle stage in the accumulation process of the sample data, a certain amount of driving data of the sample drivers and insurance policy data of a part of the sample drivers are accumulated, thus the driving behavior of the current driver can be scored by using the driving scoring method corresponding to the middle stage, and the problem existing in the prior art that the driving behavior scoring cannot be performed due to difficulty in starting a supervised algorithm due to insufficient sample data accumulation at the initial stage of system operation can be solved.

In one embodiment of the present disclosure, when the current stage is the late stage, the driving data and the claim settlement data of the sample drivers are relatively complete, the association of the driving data and the claim settlement data of the drivers is relatively integral, thus the driving behavior scoring of the current driver can be performed by using a driving scoring method based on a trained scoring model. Specifically, as shown in Fig. 5, scoring the driving behavior of the current

driver by using the driving scoring method corresponding to the current accumulation stage in step S3 may specifically include the following steps:

S341, obtaining driving scores of a plurality of sample drivers corresponding to the sample insurance policy data according to the insurance policy data of the sample drivers, and extracting the sample driving characteristics of the plurality of sample drivers from the sample driving data.

Specifically, in this step, the process of obtaining the driving scores of the plurality of sample drivers corresponding to the sample insurance policy data according to the insurance policy data of the sample drivers is the same as that in step S331, and is not described herein again.

In this step, the process of extracting the sample driving characteristics of the plurality of sample drivers from the sample driving data is the same as the step S311, and is not described herein again.

S342, establishing a driving behavior scoring model according to the driving characteristics of each sample driver and the driving scores of each sample driver.

Specifically, a driving behavior scoring model is established for the driving characteristics of each sample driver and the driving scores of each sample driver by a traditional machine learning or deep learning method, and the driving behavior scoring model is stored off-line for calling during on-line driving behavior scoring.

The driving behavior scoring model may be established by using linear regression, random forests, decision trees, xgboost and other methods, which is not limited by the disclosure.

S343, scoring the driving behavior of the current driver by using the driving behavior scoring model.

Specifically, extracting driving characteristics of a current driver from driving data of the current driver; and inputting the driving characteristics of the current driver into the driving behavior scoring model to obtain and output the driving behavior score of the current driver.

According to the embodiment of the present disclosure, when the current stage is the late stage in the accumulation process of the sample data, the driving data and the claims settlement data of the sample drivers are relatively complete, and the association between the driving data and the claims settlement data of the drivers is relatively integral, so that a driving scoring model can be obtained by adopting machine learning or deep learning training, and the driving behavior scoring is carried

out on the current driver.

Fig. 6 shows an exemplary configuration block diagram of a driving behavior scoring device according to another embodiment of the present disclosure. The driving behavior scoring device provided by the embodiment of the present disclosure may be used to execute the driving behavior scoring method in the above embodiments.

In some embodiments, the device 600 may include processing circuitry 60. The processing circuitry 60 of the device 600 provides various functions of the device 600. In some embodiments, the processing circuitry 60 of the device 600 may be configured to perform the driving behavior scoring method described above with reference to Fig. 1.

The processing circuitry 60 may refer to various implementations of digital circuitry systems, analog circuitry systems, or mixed-signal (a combination of analog and digital) circuitry systems that perform functions in a computing system. The processing circuitry may include, for example, circuitry such as an Integrated Circuit (IC) and an Application Specific Integrated Circuit (ASIC), a portion or circuit of a separate processor core, an entire processor core, a separate processor, a programmable hardware device such as a Field Programmable Gate Array (FPGA), and/or a system including multiple processors.

In some embodiments, the processing circuitry 60 may include an accumulation module 61, a determination module 62, and a scoring module 63.

The accumulation module 61 is configured to accumulate sample data, the sample data including sample driving data and sample insurance policy data of sample drivers; the determining module 62 is configured to determine a current accumulation stage of the sample data according to the accumulation amount of the sample driving data and the sample insurance policy data; the scoring module 63 is configured to score the driving behavior of the current driver using the accumulated sample data using the driving scoring method corresponding to the current accumulation stage. The above-described modules 61 to 63 may be configured to perform steps S1 to S3, respectively, in the driving behavior scoring method shown in Fig. 1 as described above.

In some embodiments, the device 600 may also include a memory (not shown). The memory of the device 600 may store information generated by the processing circuitry 60 as well as programs and data for operation of the device 600. The memory may be a volatile memory and/or a non-volatile memory. For example, the

memory may include, but is not limited to, Random Access Memory (RAM), Dynamic Random Access Memory (DRAM), Static Random Access Memory (SRAM), Read Only Memory (ROM), and flash memory. In addition, the device 600 may be implemented at a chip level, or may also be implemented at a device level by including other external components.

It should be understood that the various modules described above are merely logical modules that are divided according to the specific functions implemented by the modules, and are not intended to limit the specific implementations. In actual implementation, the respective modules as described above may be implemented as separate physical entities, or may also be implemented by a single entity (e.g., a processor (CPU, DSP, or the like), an integrated circuit, or the like).

The driving behavior scoring device provided by the embodiment of the disclosure belongs to the same inventive concept as the driving behavior scoring method provided by the embodiment of the disclosure, can perform a driving behavior scoring method provided by any embodiment of the disclosure, includes respective functional modules and beneficial effect for performing the driving behavior scoring method. For technical details not described in detail in this embodiment, reference may be made to the driving behavior scoring method provided in the embodiment of the present disclosure, which is not described in detail herein.

FIG. 7 illustrates an exemplary configuration of a computing device 700 in which embodiments according to the present disclosure may be implemented. The computing device 700 is an example of a hardware device to which the above-described aspects of the disclosure may be applied. The computing device 700 may be any machine configured to perform processing and/or computing. The computing device 700 may be, but is not limited to, a workstation, a server, a desktop computer, a laptop computer, a tablet computer, a Personal Data Assistant (PDA), a smart phone, a vehicle-mounted computer, or a combination thereof.

As shown in FIG. 7, the computing device 700 may include one or more elements that may be connected to or communicate with a bus 702 via one or more interfaces. The bus 702 may include, but is not limited to, an Industry Standard Architecture (ISA) bus, a Micro Channel Architecture (MCA) bus, an Enhanced ISA (EISA) bus, a Video Electronics Standards Association (VESA) local bus, and a Peripheral Component Interconnect (PCI) bus. The computing device 700 may include, for example, one or more processors 704, one or more input devices 706, and one or more

output devices 708. The one or more processors 704 may be any kind of processor and may include, but is not limited to, one or more general purpose processors or special purpose processors (such as a special purpose processing chip). The processor 704 may correspond, for example, to processing circuitry 60 in FIG. 6, configured to implement the functionalities of the respective modules of the device for verification of IDs and ID holders of the present disclosure. The input device 706 can be any type of input device capable of inputting information to the computing device and can include, but is not limited to, a mouse, a keyboard, a touch screen, a microphone, and/or a remote controller. The output device 708 may be any type of device capable of presenting information and may include, but is not limited to, a display, a speaker, a video/audio output terminal, a vibrator, and/or a printer.

The computing device 700 may also include or be connected to a non-transitory storage device 714, which may be any non-transitory storage device that can implement data storage, and may include, but is not limited to, a disk drive, an optical storage device, a solid-state memory, a floppy disk, a flexible disk, a hard disk, a tape, or any other magnetic medium, a compact disk, or any other optical medium, a cache memory, and/or any other memory chip or module, and/or any other medium from which a computer can read data, instructions, and/or code. The computing device 700 may also include Random Access Memory (RAM) 710 and read-only memory (ROM) 712. The ROM 712 may store programs, utilities, or processes to be executed in a nonvolatile manner. The RAM 710 may provide volatile data storage and store instructions related to the operation of the computing device 700. The computing device 700 may also include a network/bus interface 716 coupled to a data link 718. The network/bus interface 716 may be any type of device or system capable of enabling communication with external devices and/or networks and may include, but is not limited to, a modem, a network card, an infrared communication device, a wireless communication device, and/or a chipset (such as a BluetoothTM device, a 802.11 device, a WiFi device, a WiMax device, a cellular communication facility, etc.).

In addition, another embodiment of the present disclosure further provides a driving behavior scoring device, including:

- one or more processors;
- storage means for storing one or more programs;
- when the one or more programs are executed by the one or more processors, the

one or more processors are caused to implement the driving behavior scoring method as described in the above-described embodiment.

Furthermore, another embodiment of the present disclosure further provides a computer-readable storage medium on which a computer program is stored, wherein when the program is executed by a processor, implements the driving behavior scoring method as described in the above embodiments.

It should be noted that in the description of the present disclosure, the terms “first”, “second”, and the like are used for descriptive purposes only and are not to be construed as indicating or suggesting a relative importance or order.

It will be apparent to one skilled in the art that embodiments of the present disclosure may be provided as a method, a system, or a computer program product. Accordingly, embodiments of the present disclosure may take the form of an entirely hardware embodiment, an entirely software embodiment or an embodiment combining software and hardware aspects. Furthermore, embodiments of the present disclosure may take the form of a computer program product embodied on one or more computer-usable storage media (including, but not limited to, disk storage, CD-ROM, optical storage, and the like) having computer-usable program code embodied therein.

Embodiments of the present disclosure are described with reference to flowchart illustrations and/or block diagrams of methods, devices (systems), and computer program products according to embodiments of the disclosure. It will be understood that each flow and/or block of the flowchart illustrations and/or block diagrams, and combinations of flows and/or blocks in the flowchart illustrations and/or block diagrams, can be implemented by computer program instructions. These computer program instructions may be provided to a processor of a general purpose computer, special purpose computer, embedded processor, or other programmable data processing device to produce a machine, such that the instructions, which are executed via the processor of the computer or other programmable data processing device, create means for implementing the functions specified in the flowchart block(s) and/or block(s) in the block diagram.

These computer program instructions may also be stored in a computer-readable memory that can direct a computer or other programmable data processing device to function in a particular manner, such that the instructions stored in the computer-readable memory produce an article of manufacture including instruction means

which implement the function specified in the flowchart block(s) and/or block(s) in the block diagram.

These computer program instructions may also be loaded onto a computer or other programmable data processing device to cause a series of operational steps to be performed on the computer or other programmable devices to produce a computer implemented process, such that the instructions which execute on the computer or other programmable devices provide steps for implementing the functions specified in the flowchart block(s) and/or block(s) in the block diagram

While the preferred embodiments of the disclosed embodiments have been described, additional variations and modifications in these embodiments will occur to those skilled in the art once they learn of the basic inventive concepts. It is therefore intended that the following appended claims be interpreted as including the preferred embodiments and all such variations and modifications as fall within the scope of the embodiments of the disclosure.

It will be apparent to those skilled in the art that various changes and modifications can be made in the disclosure without departing from the spirit and scope of the disclosure. Thus, provided that such modifications and variations of the present disclosure are within the scope of the claims of the present disclosure and their equivalents, the present disclosure is also intended to encompass such modifications and variations.

[CLAIMS]

1. A driving behavior scoring method, characterized in that the method comprises steps of:

accumulating sample data including sample driving data and sample insurance policy data of sample drivers;

determining a current accumulation stage of the sample data according to an accumulation amount of the sample driving data and the sample insurance policy data; and

scoring a driving behavior of the current driver by the accumulated sample data using a driving scoring method corresponding to the current accumulation stage.

2. The method of claim 1, characterized in that,

when the accumulation amount of the sample insurance policy data is less than a first threshold, the current accumulation stage of the sample data is determined as a first stage, and

the driving behavior of the current driver is scored by the sample driving data in the accumulated sample data using a driving scoring method corresponding to the first stage.

3. The method of claim 1, characterized in that,

when the accumulation amount of the sample insurance policy data is above a first threshold, the current accumulation stage of the sample data is determined as a second stage, and

the driving behavior of the current driver is scored by the sample driving data and the sample insurance policy data in the accumulated sample data using a driving scoring method corresponding to the second stage.

4. The method of claim 2, characterized in that,

the first stage includes a third stage in which the accumulation amount of the sample insurance policy data is less than the first threshold and the accumulation amount of the sample driving data is less than a second threshold,

when the current accumulation stage is the third stage, the scoring the driving behavior of the current driver comprises:

acquiring driving data of the current driver, and extracting driving characteristics

of the current driver; and

obtaining a score of the driving characteristics of the current driver according to a preset scoring standard, to serve as the score of the driving behavior of the current driver.

5. The method of claim 2, characterized in that,

the first stage includes a fourth stage in which the accumulation amount of the sample insurance policy data is less than the first threshold and the accumulation amount of the sample driving data is above a second threshold,

when the current accumulation stage is the fourth stage, the scoring the driving behavior of the current driver comprises:

extracting sample driving characteristics of the sample drivers from the sample driving data of the sample drivers;

calculating distribution parameters of the sample driving characteristics according to the sample driving characteristics of the sample drivers;

acquiring driving data of the current driver, and extracting driving characteristics of the current driver; and

calculating a cumulative distribution function of the driving characteristics of the current driver according to the distribution parameters of the sample driving characteristics, to serve as the driving behavior score of the current driver.

6. The method of claim 3, characterized in that,

the second stage includes a fifth stage in which the accumulation amount of the sample insurance policy data is above the first threshold and the accumulation amount of the sample insurance policy data is less than the accumulation amount of the sample driving data,

when the current accumulation stage is the fifth stage, the scoring the driving behavior of the current driver comprises:

acquiring driving scores of a plurality of sample drivers corresponding to the sample insurance policy data according to the sample insurance policy data;

performing cluster analysis on the driving data of the plurality of sample drivers to obtain a plurality of cluster centers, wherein each cluster serves as a risk grade cluster, and calculating the driving score of each risk grade cluster according to the driving scores of the plurality of sample drivers;

acquiring driving data of the current driver, and calculating a similarity distance between the driving data of the current driver and the plurality of cluster centers; and
determining a risk grade cluster corresponding to the current driver according to the calculation result of the similarity distance, and taking the driving score of the determined risk grade cluster as the driving score of the current driver.

7. The method of claim 3, characterized in that,

the second stage includes a sixth stage in which the accumulation amount of the sample insurance policy data is above the first threshold and the accumulation amount of the sample insurance policy data is equal to the accumulation amount of the sample driving data,

when the current accumulation stage is the sixth stage, the scoring the driving behavior of the current driver comprises:

acquiring driving scores of a plurality of sample drivers corresponding to the sample insurance policy data according to the sample insurance policy data;

extracting sample driving characteristics of the plurality of sample drivers from the sample driving data;

establishing a driving behavior scoring model according to the sample driving characteristics and the corresponding driving scores of the plurality of sample drivers;
and

scoring the driving behavior of the current driver by using the driving behavior scoring model.

8. The method of claim 6 or 7, characterized in that the obtaining the driving scores of a plurality of sample drivers corresponding to the policy data according to the sample insurance policy data comprises:

for the sample insurance policy data of each of the plurality of sample drivers, performing the following operations:

acquiring an insurance claim value from the sample insurance policy data; and

determining the driving score which has a mapping relation with the insurance claim value according to a preset mapping relation table, to serve as the driving score of the sample driver.

9. A driving behavior scoring device, characterized in that the device comprises:

an accumulation module configured to accumulate sample data including sample driving data and sample insurance policy data of sample drivers;

a determining module configured to determine a current accumulation stage of the sample data according to an accumulation amount of the sample driving data and the sample insurance policy data; and

a scoring module configured to score a driving behavior of the current driver by the accumulated sample data using a driving scoring method corresponding to the current accumulation stage.

10. The device of claim 9, characterized in that

when the accumulation amount of the sample insurance policy data is less than a first threshold, the current accumulation stage of the sample data is determined as a first stage, and

the driving behavior of the current driver is scored by the sample driving data in the accumulated sample data using a driving scoring method corresponding to the first stage.

11. The device of claim 9, characterized in that,

when the accumulation amount of the sample insurance policy data is above a first threshold, the current accumulation stage of the sample data is determined as a second stage, and

the driving behavior of the current driver is scored by the sample driving data and the sample insurance policy data in the accumulated sample data using a driving scoring method corresponding to the second stage.

12. The device of claim 10, characterized in that,

the first stage includes a third stage in which the accumulation amount of the sample insurance policy data is less than the first threshold and the accumulation amount of the sample driving data is less than a second threshold,

when the current accumulation stage is the third stage, the scoring module is configured to:

acquire driving data of the current driver, and extract driving characteristics of the current driver; and

obtain a score of the driving characteristics of the current driver according to a

preset scoring standard, to serve as the score of the driving behavior of the current driver.

13. The device of claim 10, characterized in that,

the first stage includes a fourth stage in which the accumulation amount of the sample insurance policy data is less than the first threshold and the accumulation amount of the sample driving data is above a second threshold,

when the current accumulation stage is the fourth stage, the scoring module is configured to:

extract sample driving characteristics of the sample drivers from the sample driving data of the sample drivers;

calculate distribution parameters of the sample driving characteristics according to the sample driving characteristics of the sample drivers;

acquire driving data of the current driver, and extract driving characteristics of the current driver; and

calculate a cumulative distribution function of the driving characteristics of the current driver according to the distribution parameters of the sample driving characteristics, to serve as the driving behavior score of the current driver.

14. The device of claim 11, characterized in that,

the second stage includes a fifth stage in which the accumulation amount of the sample insurance policy data is above the first threshold and the accumulation amount of the sample insurance policy data is less than the accumulation amount of the sample driving data,

when the current accumulation stage is the fifth stage, the scoring module is configured to:

acquire driving scores of a plurality of sample drivers corresponding to the sample insurance policy data according to the sample insurance policy data;

perform cluster analysis on the driving data of the plurality of sample drivers to obtain a plurality of cluster centers, wherein each cluster serves as a risk grade cluster, and calculate the driving score of each risk grade cluster according to the driving scores of the plurality of sample drivers;

acquire driving data of the current driver, and calculate a similarity distance between the driving data of the current driver and the plurality of cluster centers; and

determine a risk grade cluster corresponding to the current driver according to the calculation result of the similarity distance, and take the driving score of the determined risk grade cluster as the driving score of the current driver.

15. The device of claim 11, characterized in that,

the second stage includes a sixth stage in which the accumulation amount of the sample insurance policy data is above the first threshold and the accumulation amount of the sample insurance policy data is equal to the accumulation amount of the sample driving data,

when the current accumulation stage is the sixth stage, the scoring module is configured to:

acquire driving scores of a plurality of sample drivers corresponding to the sample insurance policy data according to the sample insurance policy data;

extract sample driving characteristics of the plurality of sample drivers from the sample driving data;

establish a driving behavior scoring model according to the sample driving characteristics and the corresponding driving scores of the plurality of sample drivers;
and

score the driving behavior of the current driver by using the driving behavior scoring model.

16. The device according to claim 14 or 15, characterized in that the obtaining the driving scores of a plurality of sample drivers corresponding to the policy data according to the sample insurance policy data comprises:

for the sample insurance policy data of each of the plurality of sample drivers, performing the following operations:

acquiring an insurance claim value from the sample insurance policy data; and

determining the driving score which has a mapping relation with the insurance claim value according to a preset mapping relation table, to serve as the driving score of the sample driver.

17. A driving behavior scoring device, characterized in comprising:

one or more processors;

storage means for storing one or more programs;

wherein when the one or more programs are executed by the one or more processors, the one or more processors are caused to implement the driving behavior scoring method as claimed in any one of claims 1 to 8.

18. A computer-readable storage medium on which a computer program is stored, wherein when the program is executed by a processor, implements the driving behavior scoring method as claimed in any one of claims 1 to 8.